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CAR CULTURE AMONG YOUNG GENERATIONS

A Mixed-Methods Study of University Students' Transport Perceptions in the Porto Metropolitan Area

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Dedicated to my family and friends

Se podes olhar, vê. Se podes ver, repara."

José Saramago

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Thank you to everyone who has always accompanied me with affection and care. It was not an easy journey; it had its ups and downs, but I am so lucky and can say that I have the privilege of being surrounded by people for whom I am so grateful and who complete me so much.

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ABSTRACT

The objective of this dissertation is to explore the recent evolution in car use and driver licensing among young adults, while investigating the social and psychological motives behind this trend. Focusing on the Portuguese context, specifically the Porto Metropolitan Area , the study uses a mixed-methods approach to link macro-level data with individual perceptions. The quantitative phase analyses national administrative data on annual driver licence acquisitions from the *Instituto de Mobilidade e Transportes* (IMT) between 2015 and 2025, alongside commuting data from national censuses *Instituto Nacional de Estatística* (INE) between 1981 and 2021. The qualitative data complements this by exploring the personal views and habits of 15 university students in Porto through a demographic questionnaire, four focus groups and four interviews.

The quantitative results confirm a structural, long-term downward trend in the acquisition of driving licenses among the 18 to 24 age group, with a stabilisation of car commuting growth, with students in the Porto Metropolitan Area displaying a significantly lower reliance on cars than the employed population in 2021. Qualitatively, the study suggests that young adults prioritise financial independence and career stability, viewing the private car as an expensive financial burden and depreciating investment. While car ownership is intentionally delayed, it remains strongly associated with future lifecycle milestones, particularly parenthood and professional requirements,

The results also suggest that residential location significantly influences travel behaviour. Young adults living in central Porto are less car-dependent because they have good access to public transport and active travel options. In contrast, those living in the suburban municipalities are more likely to rely on cars due to limited public transport services.

KEYWORDS: Car Culture, Young Adults, Public Transportation, Mixed-Methods, Porto Metropolitan Area.

RESUMO

O objetivo desta dissertação é explorar a evolução recente da utilização do automóvel e da obtenção da carta de condução entre os jovens adultos, investigando simultaneamente os fatores sociais e psicológicos que explicam esta tendência. Centrado no contexto português, mais especificamente na Área Metropolitana do Porto, o estudo adota uma abordagem de métodos mistos para relacionar dados a nível macro com as perceções individuais. A componente quantitativa analisa dados administrativos nacionais sobre a aquisição anual de cartas de condução pelo Instituto de Mobilidade e dos Transportes (IMT) entre 2015 e 2025, e dados dos Censos do Instituto Nacional de Estatística (INE) entre 1981 e 2021, associados a movimentos pendulares. A componente qualitativa complementa esta análise através da exploração das perceções e hábitos de 15 estudantes universitários no Porto, recorrendo a um questionário sociodemográfico, quatro *focus groups e* quatro entrevistas.

Os resultados quantitativos demonstram uma tendência estrutural e de longo prazo de diminuição da aquisição de cartas de condução entre jovens dos 18 aos 24 anos, acompanhada de uma estabilização do crescimento das deslocações pendulares em automóvel. Em 2021, os estudantes da Área Metropolitana do Porto apresentavam uma dependência significativamente menor do automóvel do que a da população empregada. A análise qualitativa sugere que os jovens adultos dão prioridade à independência financeira e à estabilidade profissional, encarando o automóvel privado como um encargo financeiro elevado e um investimento que perde valor ao longo do tempo. Embora a posse de um automóvel seja intencionalmente adiada, continua fortemente associada a etapas futuras do ciclo de vida, em particular à parentalidade e às exigências profissionais.

Os resultados sugerem ainda que o localização influencia significativamente os padrões de mobilidade. Os jovens adultos que vivem na zona central do Porto apresentam menor dependência do automóvel devido ao melhor acesso ao transporte público e aos modos de mobilidade ativa. Em contraste, aqueles que residem nos municípios suburbanos tendem a depender mais do automóvel, em consequência das limitações da oferta de transporte público.

PALAVRAS-CHAVE: Cultura Automóvel, Jovens Adultos, Transportes Públicos, Métodos Mistos, Área Metropolitana do Porto.

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SYMBOLS, ACRONYMS AND ABBREVIATIONS

IMT – Instituto de Mobilidade e dos Transportes

INE – Instituto Nacional de Estatística

STEM – Science Technological Engineer and Mechanical

1 INTRODUCTION

Over recent decades, as a result of the pressure of motorization, car culture has been constantly changing (Lee-Gosselin, 2017). Car-centric cities have been more pronounced, because of low-density sprawl, decentralisation of facilities and commerce, wide roads, and large parking areas. Likewise, most of the city space is dedicated to this mode of transportation (Gössling, 2020). This leads to the normalisation of its use and disincentivises people to use public transportation or active mobility. This situation has led to a reliance on cars among the population, leading to multiple externalities from environmental, social, and economic perspectives, such as congestion, air pollution, greenhouse gas emissions, noise, and accidents (Zefreh & Torok, 2021).

What started as a solution to increase mobility, comfort and productivity is now not as desirable. Recent evidences suggest that young adults tend to own a car or even obtain a driver's license only when it is perceived as a necessity or a financial possibility (Hjorthol, 2016). There are a lot of factors that make this option increasingly undesirable, and some of it comes from a drastic change in mentality. Nowadays, younger generations demonstrate a paradigm shift, perceiving the car as a necessity and not as much as a status symbol. This change in the mobility culture is strongly encouraged by a sustainability perspective. Although this post-car society can be considered radical, some researchers perceive it as an essential and needed solution for the environment (Mögele & Rau, 2020).

Following the categorisation of Stolze, car culture among the younger generation can be understood as a group-specific mobility culture, where members of a generational cohort share similar mobility-related beliefs, practices, and material preferences related to car use (Stolze et al., 2025). Mobility culture is different from country to country, gaining expression depending on its level of industrialisation (Prieto-Curiel & Ospina, 2024).

Although many studies prove it is possible to characterize mobility cultures through comparative studies (Stolze et al., 2025), it is hard to find a unique mobility definition, since this term has different approaches and drivers. While some see it as a paradigm shift, from fossil-fuel dependence to cleaner energy and a low-carbon society, some contemplate it as a comparison between different modes of everyday mobility, or even from a meaning-oriented approach, which emphasizes not changes in transport modes and energy themselves, but also underlying reasons, motives, perceptions, and emotions that drive those changes. (Mögele & Rau, 2020).

It's important to emphasize the lack of studies addressing the influence on mobility culture of the car-manufacturing sector and the spatial dispersion (Mögele & Rau, 2020) which became increasingly pronounced over time (Ostermeijer et al., 2022). Analysing the user perspective solely without investigating the core of the problem might underestimate the real and truly impactful factors.

Previous research suggests that young people are using cars less because of financial, environmental and social reasons. The literature suggests some hypothesis which attempt to explain the decline in the interest and usage. This study examines whether these explanations are also true in the Porto Metropolitan Area. To fully understand the complexities of this generational trend, this dissertation connects empirical evidence with personal insights.

The principal objective of this study is to explore the recent evolution car usage and driver's licensing among young adults, while exploring the financial, social and psychological motives behind this evolution. Focusing on the Portuguese context, specifically in the Porto Metropolitan Area, the dissertation uses a mixed -method approach. By combining a quantitative analysis of general population data with qualitative interviews and focus groups, this research explores behavioural factors driving the shift away from car dependency.

This dissertation has five chapters. Chapter 2 reviews previous research on young people's travel behaviour. Chapter 3 explains the research methods, including the analysis of driving license and census data, together with focus groups and interviews with university students in Porto. Chapter 4 presents the main results, combining statistical data with students' views, opinions and perceptions. Finally, Chapter 5 summarises the main findings, outlines the study limitations and suggests areas for future research.

2
LITERATURE REVIEW

2.1 MOBILITY TRENDS AMONG YOUNG PEOPLE

The literature indicates that the observed decline in automobile usage is not a uniform trend. Thus, a comprehensive understanding of this phenomenon requires a rigorous quantification and qualification of these shifting mobility patterns.

The phenomenon of peak car, for instance, describes how the number of car users has already reached its peak in many industrialized countries, around the turn of the millennium (Cubells et al., 2020). For example, in the United States, the number of miles vehicles travelled from 2007 to 2019, has stagnated (Cohen, 2019). In Germany, the numbers follow the same path, with a 6% decrease in the daily volume of car use between 2002 and 2017 (Konietzka & Neugebauer, 2023). is a phenomenon specific to post-industrial economies, whereas emerging markets show opposite trends. In countries such as Nigeria, a growth of 382% in vehicle ownership, from 1970 to 2010, was verified, due to rapid urbanization and economic progress (Ukonze et al., 2020).

This trend in car use can also be qualified through the decline in licensing rates among youth. As mentioned before, there is a significant decline in the acquisition of driver's licenses among young adults, which can be verified in the United States, the United Kingdom, Germany, Norway and Australia (Hopkins, 2016). In Germany, the share of license holders aged 17–20 dropped from 57.4% in 2012 to 44.1% by 2025 (Reinfeld & Hagen, 2026). In Europe, the number of young people with a license at the initial entry level dropped from 48% to 29% (Cohen, 2019).

In addition, the growth in multimodality observed in younger generations describes an exchange from the car to different modes of transportation, such as public transportation, cycling, and walking (Cadima et al., 2025). This phenomenon is observed in Germany and Great Britain, where an increase in multimodality offsets the decline in car travel (Kuhnimhof et al., 2012). This mobility shift is more significant in dense urban centres, where a greater variety of alternative transportation modes is available, such as Prague or Barcelona, for instance (Cubells et al., 2020).

There is a notable gender difference in the decline in car use. When analysing women's behaviour, there is a stagnation or an increase; thus, the gap between genders has narrowed (Kuhnimhof et al., 2012). For example, in the case of the Faculty of Engineering of the University of Porto (FEUP), the gender gap in car use as a driver, between 2006 and 2023, has declined. A reduction in car use among men, and an increase among the female gender mostly caused this phenomenon (Cadima et al., 2025).

However, in some cases, this decline is not verified, since travel patterns are highly influenced by life-course events. For example, in the Netherlands, when confronted with the transition from full-time education to the workforce, young adults showed an increase in car use and a decrease in cycling and public transport use (Stolze et al., 2025). Also, in Germany, a similar phenomenon occurs. When given a higher income and stricter time constraints, young adults tend to shift from multimodality to driving (Tao et al., 2025). Some more traditional life milestones, such as the birth of a child, strongly motivate the need to acquire a car and increase car use (Gu et al., 2021).

There are also geographical disparities, based on urban density and the quality of local service offerings. When comparing a country's capital and a smaller city, such as the Czech Republic and Ústí nad Labem, the results show that public transport and shared mobility are more commonly used among young adults in the capital. This happens due to the robust infrastructure that can be found in big cities, while smaller ones still show a great dependency on cars (Konietzka & Neugebauer, 2023).

When analysing mobility and car culture, it is important to carefully measure the impact of disruptive events, from historical to sanitary crises. The Great Recession of 2007 to 2009, for example, had a big impact on mobility, especially among men. Historically, this gender has proven a high reliance on motorized modes; however, with the crisis, this gender showed less reliance on the car, due to economic reasons, while women showed a softer decline in use (Cadima et al., 2025). More recently, the pandemic also showed a big impact on mobility culture. At the University of Porto, more precisely, in the Faculty of Engineering, research revealed that during the pandemic years, there was a shift toward using cars more frequently, potentially due to increased concerns regarding hygiene and sanitary safety (Cadima et al., 2025). In Germany, there was also a decline in driver's licenses during the pandemic years, falling 6,4 percentage points, in relation to pre-pandemic levels (Reinfeld & Hagen, 2026)

2.2 Factors for Reduced Car Use among Young People

Various factors influence the car prospects among young people. With the rise of the age of emancipation, young adults are delaying the big markers of adulthood, such as entering the workforce, marrying, and having children (Tao et al., 2025). When entering this stage of life, people perceive the car as a necessity and, for some, a crucial element of the routine (Fronteli & Pacheco Paladini, 2023). For example, young Catalan adults, when compared with younger generations, are getting a job, getting married, or becoming parents later. Thus, they have fewer motives to travel. Without a strong reason, plus a lack of financial independence, owning a car is perceived by many as unnecessary and a burden. Having this in mind, a new hypothesis urges: when these young adults get older and start having jobs and kids, there is a possibility of a rise in travel and car demand (Cubells et al., 2020).

One of the main factors for reduced car use is financial instability. Young adults are going through a period of strong financial constraints, from unemployment to housing crises, turning the purchase of a car into something secondary (Hopkins & Stephenson, 2014). Furthermore, the costs of owning a car itself, such as the high cost of driving associated with fuel, car acquisition, driving school, and licensing fees, etc., make it financially unmanageable and less attractive (Cubells et al., 2020).

The context significantly influences how the car is viewed. The number of young adults living in denser urban areas is increasing, and as a result, the need for cars is decreasing. This trend can be explained by shorter travel distances and the availability of alternative transportation options, which tend to be more cost-effective. Owning a car in a busy city centre can often feel more like a burden than a convenience or comfort, due to traffic congestion and limited parking.

In addition to all these factors mentioned, there is the present technology and digital connectivity, which have brought remote working, shopping, and social networking within a click, contributing to a decrease in travel demand (Cohen, 2019). Additionally, technology can be used as a tool to find shared mobility and public transportation, making it more accessible and easy to understand, changing the spotlight from the car to multimodality, for example (Hopkins, 2017).

The rise of shared mobility, such as bike-sharing and car-sharing, for example, is seen as a better alternative to owning a car. For young people, this option is more attractive since it makes it possible to have the flexibility, comfort, and independence without the financial burden associated with a personal vehicle (Cohen, 2019) .

As a way of combating climate change, the legal aspect of owning a car becomes harder as days pass by, financially and bureaucratically. The cost of owning a car can vary from several hundred euros to more than 1000 euros per month (Miner et al., 2024). Bureaucratically, many nations are implementing stricter regulations and planning restrictions that discourage private vehicle dependency in favour of more sustainable alternatives. This environment is motivating a discursive shift from a "car state" mindset toward a "mobility-state" framework, where the focus moves away from the private car as a central mode of transport (Mögele & Rau, 2020). Consequently, for younger generations, the automobile is losing its role as a status symbol and is increasingly perceived as a necessity, rather than as an extension of individual personality (Burlando et al., 2019).

Table 1 – Factors for reduced car use among young people

Factor	Impact	Bibliography
Delayed Life Milestones	Delayed marriage, leaving parents' house, etc., leading to less need for a car.	(Cubells et al., 2020; Fronteli & Pacheco Paladini, 2023; Tao et al., 2025)
Economic Instability	Lower wages, unemployment, etc, make the purchase of a car unbearable.	(Cubells et al., 2020; Hopkins, 2017)
Level of Urbanisation	Preference for living in city centres, with shorter distances, more congestion and fewer parking spots.	(Cohen, 2019; Hopkins, 2017)
Technology and More Connectivity	Public transportation is more accessible at the moment, making it more appealing, with more connectivity and less necessity for physical shopping, working, and socialising.	Cohen, 2019; Hopkins, 2017)
Rise of Shared Mobility	More autonomy and flexibility without the costs of owning.	(Cohen, 2019)
Environmental legal obligations	More awareness of the environmental impact, in alliance with legal obligations and increased cost.	(Burlando et al., 2019; Miner et al., 2024; Mögele & Rau, 2020)

Various external factors contribute to the decline of car culture among young adults. However, it is important to consider other internal factors and attitudes to understand the real reason behind this decline better.

2.3 ATTITUDES TOWARDS THE CAR

While factors are objective, external and structural, attitudes are based mostly on emotions and internal psychological evaluations. These attitudes contribute to a better understanding of what it takes for young generations to perceive the car as they do. Attitudes can be divided into instrumental, such as safety and speed, symbolic, which is associated with status and self-expression, and affective, like the pleasure of driving, for example (Zhou & Wang, 2019).

Starting with the change in the perception of the car from a status symbol to a necessity. However, it is important to reinforce the idea that in most cases, this erosion of the car as a status symbol has been replaced by other objects, such as technological devices or even activities and experiences (Bahles & Cook, 2017). With the rise of social media, young people are more likely to pay more attention to how they present themselves online rather than physically, which can explain a lessening perception of the car as a symbol of success. (Cohen, 2019).

The car is not associated with the individual personality as it used to be. Now, the car is perceived as a tool, as a necessity (Ortar & Vincent-Geslin, 2017). Generation Z chooses transport based on speed, effectiveness, and cost, reinforcing the functional relation with the car (Vávrová et al., 2025). Climate change has a big impact on Generation Z's perspective on the car. The strong and direct association of cars with air and noise pollution, the use of fossil fuels, etc. (Burlando et al., 2019) discourage young adults from choosing this mode of transportation. This generation tends to have more sustainability awareness when choosing transportation.

It is important to compare different genders since, as mentioned above, the decline is steeper for the masculine gender. Furthermore, perceptions of the car change based on gender. While the masculine gender tends to see the more symbolic aspect of it, the feminine gender is more worried about safety(Drevon et al., 2022). Furthermore, attitudes change from culture to culture. In Southern Europe and Latin America, the car retains a higher status when compared to Northern European and Scandinavian countries (Bahles & Cook, 2017), along with the social environment, which creates or does not create the feeling of belonging. When analysing a group of young adults where owning a car is normal, it is more likely that those who do not have one want to have one (Soza-Parra & Cats, 2024).

Table 2 – Attitudes towards the car among young people

Attitudes	Impact	Bibliography
Status Decline	Decrease in the desire to have a car, since it is less associated with status.	(Bahles & Cook, 2017; Cohen, 2019)
Functionality	Bigger focus on efficiency, speed, and cost-effectiveness for specific trips.	(Ortar & Vincent-Geslin, 2017; Vávrová et al., 2025)
Environmental Awareness	Rejection of the car due to the environmental impact.	(Burlando et al., 2019; Vávrová et al., 2025)
Affective and Symbolic Motives	Weaken the psychological link to the car.	(Drevon et al., 2022; Zhou & Wang, 2019)
Social Norms	Pressure to have a license has decreased, since car ownership is not as important as it used to be.	(Soza-Parra & Cats, 2024)
Gender Perception	Men value status more, and women are more careful with safety, which may lead to lower usage.	(Drevon et al., 2022)

These changes in attitudes show a detachment from the car-centric city. The car is no longer the big adulthood mark. Now, the car is more perceived as a utility instead of a status symbol. The rise of environmental consciousness is one of the main drivers of this paradigm shift. Together, these changes in attitudes are leading to a decrease in car use, as shown through empirical evidence.

2.4 EMPIRICAL APPROACHES AND METHODOLOGIES

When it comes to analysing car use and its increase or decline, numerous factors and methods make it possible to quantify it. The research approaches verified in the literature review vary between quantitative and qualitative; quantitative methods are mostly used to show the decline of car use, while qualitative approaches explore the principal factors that drive this change. To explore the factors that drive this change, the methodologies used are more focused on opinion-based approaches such as interviews, focus groups and surveys.

Car culture can be quantified through car ownership (Wu et al., 2016) or driver's licenses (Reinfeld & Hagen, 2026). One way of approaching car ownership is by analysing city statistical yearbooks. However, this has some challenges when it comes to capturing the heterogeneity of data that might not be observed directly. Thus, when comparing models, the fixed- and random-effect models were found to be more adequate, according to the Hausman test. (Wu et al., 2016). This model compares cities individually instead of as a group, accounting for heterogeneity across cities and giving each city its own model based on its economy, urban, and transportation characteristics.

On the other hand, when measuring the share of driver's license holders, an important factor to consider is to utilise longitudinal panel data, in this specific case, from the German Mobility Panel, or retrospective data to perceive life traditions (Reinfeld & Hagen, 2026). Using a discrete-time survival model where the principal variables are age and cohort, it provides a "time-to-event" analysis, effectively managing left-truncated and right-censored data. This methodology uses a proxy variable approach to identify Age-Period-Cohort effects and inflation-adjusted cost indices to isolate temporal trends. Consequently, it's possible to distinguish whether reduced car use among the younger generation is permanent or a lifecycle-related delay (Reinfeld & Hagen, 2026).

An alternative approach to analysing household car ownership involves examining the correlation between vehicle transitions and key life-cycle events. In this instance, a latent class competing risks model was employed to analyse the initial survey data to overcome the limitations of statistics and hazard-based models. This approach combines a latent class model with a competing risks model to identify unobserved heterogeneity in the population. The analysis distinguishes two latent classes: “young households without a car” and “middle-aged and aged households with car(s)”. The competing risks identified were “purchasing”, “replacing”, and “disposing”. (Gu et al., 2021)

To investigate how significant life transitions, specifically leaving full-time education, disrupt established travel habits and open “windows of opportunity” for mode switches. The model used was a multilevel interrupted time series analysis based on ten years of data from the Netherlands Mobility Panel. This approach breaks down changes into two parts: intercept and slope changes. The intercept changes cover the immediate impact right after the transition and the slope changes consider the long-term trends over time, while also accounting for differences between individuals. (Tao et al., 2025)

Another effective way of measuring car use and how it relates to socialisation is through an online survey. As mentioned before, travel socialisation is one factor that has been proven to impact car use. To facilitate data analysis, it’s important to form hypotheses. This can be grouped by the influence of parents, the influence of friends, symbolic and affective value and indirect effects of socialisation, facilitated by norms, habits and individual intentions. When collecting data, the questions contemplated norms, habits, intention, socialisation, mobility behaviours, and socio-demographics. The model used to analyse the data was a structural equation model, which allowed the exploration of complex, indirect effects on behaviours such as communication with family and peers. (Haustein et al., 2009)

To understand the specific mobility needs of a university community, the approach utilised was an online revealed preference survey, capturing both practical and emotional travel drivers. Ridge regression equations and logit models were used to estimate the probability of a respondent’s willingness to switch modes of transportation based on demographics and satisfaction. This dual-modelling approach helps distinguish distinct behavioural patterns between students and faculty members. (Cazorla-Vanegas & Ávila-Ordoñez, 2023)

To analyse modal choice in youth, the chosen approach was focus group sessions followed by an iterative process of open and axial coding. Using grounded theory to analyse data, three categories were identified: personal, social, and physical environment factors. The analysis was reinforced with quantitative counts of participants discussing specific themes. This methodology is particularly effective for identifying specific facilitators to active transportation, such as safety and social norms, often overlooked by standardised quantitative models. As the methodology chosen for the analysis of the current paradigm of car use presented in this dissertation, further information and details are in Chapter 3.2. (Simons et al., 2014)

A culturally sensitive analysis of the "car state" focuses on the social construction of mobility through argumentative discourse analysis. This methodology shifts the analytical focus from quantifiable metrics to the implicit cultural meaning and power relations present in political negotiations. During the analysis, the key elements were the identification of storylines (condensed narratives) and discourse coalitions (groups of actors sharing a social construct). This approach maps how dominant narratives legitimate the car-centric status quo for systemic shifts toward a mobility state, through ethnography, expert interviews and documentary analysis.(Mögele & Rau, 2020)

To understand the decline in car use among younger generations, a mixed-methods investigation can be conducted. The methodology combines quantitative analysis of longitudinal household travel surveys with qualitative life-trajectory interviews. This allows for the statistical characterisation of behaviour in relation to distance and mode choice, while exploring the underlying social practices and evolving relationships with automobiles. This way, it's possible to identify early travel experiences and life-stage circumstances that influence the long-term irreversibility of car-free or car-less lifestyles. (Ortar & Vincent-Geslin, 2017)

Table 3 – Empirical approaches and methodologies

Focus	Data Collection Method	Approach	Bibliography
Quantitative			
Primary Data (Questionnaires)			
Travel Socialization	Web retrospective survey	Structural Equation Modeling (SEM)	(Haustein et al., 2009)
Life-course dynamics	Web retrospective survey	Latent Class Competing Risks Model	(Gu et al., 2021)
Campus mobility patterns	Web retrospective survey	Ridge Regression and Logit	(Cazorla-Vanegas & Ávila-Ordoñez, 2023)
Secondary Data (Panel/National)			
Education-Work Transition	Netherlands Mobility Panel	Multilevel Interrupted Time Series	(Tao et al., 2025)(
Determinants of ownership (China)	City Statistical Yearbooks	Fixed and Random Effect Models	(Wu et al., 2016)
Licensing delay	German Mobility Panel	Discrete-time Survival Analysis	(Reinfeld & Hagen, 2026)
Qualitative			
Interviews and Textual Analysis			
Modal choice in youth	**Focus Groups**	**Grounded Theory**	(Simons et al., 2014)
Mobility discourses	Ethnography, interviews, and documentary analysis	Storylines and Discourse Coalitions	(Mogale & Rau, 2020)
Decline in car use	Qualitative interviews and surveys	Mixed Method Investigation	(Ortar & Vincent-Geslin, 2017)

3
METHODOLOGY

To explore the recent evolution in car usage and driver's licensing among young adults, while investigating the social, financial and psychological motives behind this trend, a mixed-methods approach was adopted. This approach allows for an integration of macro-level quantitative data with the individual perceptions and personal experiences of the younger generation. By combining these two complementary perspectives, the study provides a more comprehensive understanding of the shifting car culture and mobility paradigms within the Porto Metropolitan Area.

The literature review reveals that understanding mobility shifts requires addressing both the scale of the trend and its causes. Thus, this study establishes a hierarchical hypothesis framework: a general hypothesis to test if the decline in car usage is structural and three sub-hypotheses to explore the financial, social and lifestyle dynamics.

- **General Hypothesis**: Younger generations are reducing car usage.
    - **Hypothesis 1 (Financial factors):** Younger generations are more aware of the financial burden of car ownership.
    - **Hypothesis 2 (Social and Lifecycle Shifts):** Younger generations are delaying overall emancipation.
    - **Hypothesis 3 (Lifestyle and Utility Preferences):** Younger generations prioritise experiences over material.

This analysis is structured into two phases. The first phase focuses on characterising general behaviour and commuting trends at the national level and within the Porto Metropolitan Area. This phase analyses administrative data on annual driver's licensing from the *Instituto de Mobilidade e dos Transportes* (IMT) and commuting data from the national Censuses provided by the *Instituto Nacional de Estatística* (INE) to establish a structural baseline of real-world mobility patterns. This first phase serves to answer the General Hypothesis, evaluating if a structural decline in car usage is occurring among younger generations.

The second phase explores the subjective aspects of car culture. Through a demographic questionnaire, four focus groups and four individual interviews, with 15 Porto University students, this stage investigates the attitudes, habits, obstacles and future expectations of young adults, regarding car dependency, ownership and overall perception. This qualitative phase explores the three sub-hypotheses, exploring the personal, economic and social drivers behind the macro-level trends.

3.1 QUANTITATIVE ANALYSIS

To provide a comprehensive background, a quantitative analysis was conducted, divided into two distinct phases: new driver's licence trends and commuting patterns. This baseline has as its main objective to establish whether the individual behavioural shifts observed in the focus groups and interviews reflect a more structural paradigm shift, and to confirm whether the reality of Portugal and the Porto Metropolitan Area corresponds to, or is consistent with, what is observed in the literature review. Initial administrative data provided by the *Instituto de Mobilidade e dos Transportes* was analysed over an 11-year timeline (2015-2025). This data evaluates the volume of new driver's licenses acquired annually.

To evaluate long-term trends in modal split and car dependency, historical data from the national Censuses (1981-2021) was obtained from the INE. This data tracks the use of different modes of transport for daily commuting throughout the years. The information provided by INE has two dimensions: socio-professional status (comparing students and workers) and geographic scale, filtered to the municipality level. On a first level, an analysis of the whole population was made to understand the main trends. A comparison between workers and students was made as a way to strengthen the study, to understand if the paradigm shift is merely observable among students or if it applies to the rest of the population.

The percentage of car users was calculated based on the sum of all commuting trips, which includes all modes of transportation, from walking to collective transportation, bicycle, etc., and all age groups, from zero to over 65 years old. Thus, the total presented on Figure 6 represents not only university students, but also primary and secondary pupils. It's also important to note the impact of the pandemic, which is associated with a decrease in the number of movements, as mentioned previously.

3.2 Qualitative Analysis

The main objective of the qualitative approach was to understand the personal views of young adults regarding car use and ownership. While statistical data show broad trends, this qualitative phase explores the personal, financial, and lifestyle reasons behind car ownership and use for a sample of university students. The design of this qualitative methodology, particularly the structure of the focus group and interviews, was based on two papers explored in the literature review: "Why do young adults choose different transport modes? A focus group study" (Simons et al., 2014) and "Car use of young adults: The role of travel socialisation" (Haustein et al., 2009). These two papers played a big role in defining the best approaches to stimulate open discussion and capture true cultural, social, and behavioural factors.

The study consisted of two parts. Initially, participants completed a brief questionnaire collecting socio-demographic information, including their study area, driver's license possession and car ownership. The questionnaire also gathered information about participants' residential context, to understand if their term-time residence was situated in an urban or suburban area. Related to habits and behaviours, participants were asked for their perception of public transport adequacy, frequency of car use for daily and leisure-related trips, preferences regarding distance and travel time for choosing the car and past transport habits during adolescence.

Then, four focus groups; one with four participants, two with two participants and one with three; and four individual interviews were conducted to evaluate perceptions and opinions about the car. The study can be divided into four main groups: the importance of owning a car within life goals; future intentions regarding car ownership; car dependency and autonomy perception; and main opinions about mobility and urban space.

3.2.1 Participant Sample

The sample included students aged 18 to 25 years old, who were recruited through group chats based on availability and corresponding conditions. The requirements applied were belonging to the same age group (18-25 years old) and being a university student in the city of Porto. All participants consented to participate in the study and granted permission for their quotes[1] to be included in the present study.

The interviews and focus groups were conducted between 18 and 30 May of 2026, and recorded, with the consent of the participants. The individual interviews lasted between 40 minutes and one hour, while the focus group sessions ranged from one hour to one and a half hours. The audio recordings were then transcribed and analysed to extract key evidence to validate or refute the study's hypotheses. To provide a baseline for the subsequent qualitative research, the socio-demographic and behavioural profiles of the participants (n=15) were captured through Google Forms. The study sample consists of young adults aged 21 to 25, with ten male and five female participants.

[1] The research was conducted in Portuguese and afterwards translated to English.

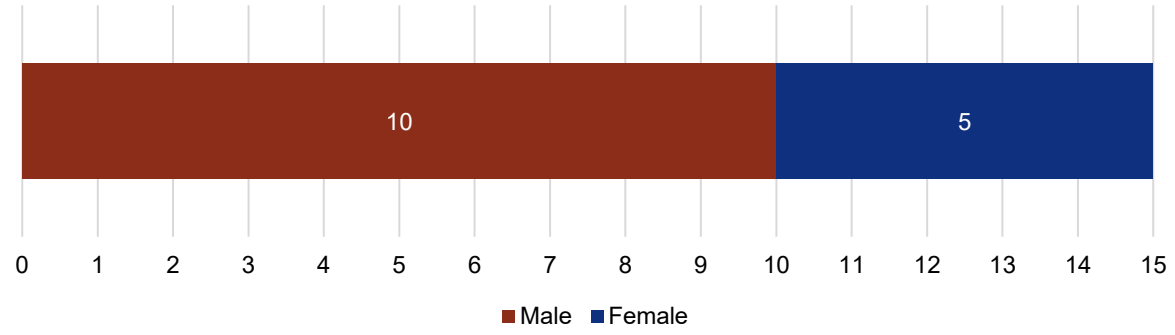


Figure 1 – Gender of the participants

Geographically, the sample represents individuals living within municipalities of the Porto Metropolitan Area, including Porto (Paranhos, Massarelos, Aldoar), Vila Nova de Gaia (Canidelo, Gulpilhares, Mafamude), Matosinhos (Custóias, São Mamede de Infesta), Maia and Gondomar, and one participant from Amarante. This demographic data can be divided into two big categories: inside the Porto Metropolitan Core and outside the Porto Metropolitan Area.

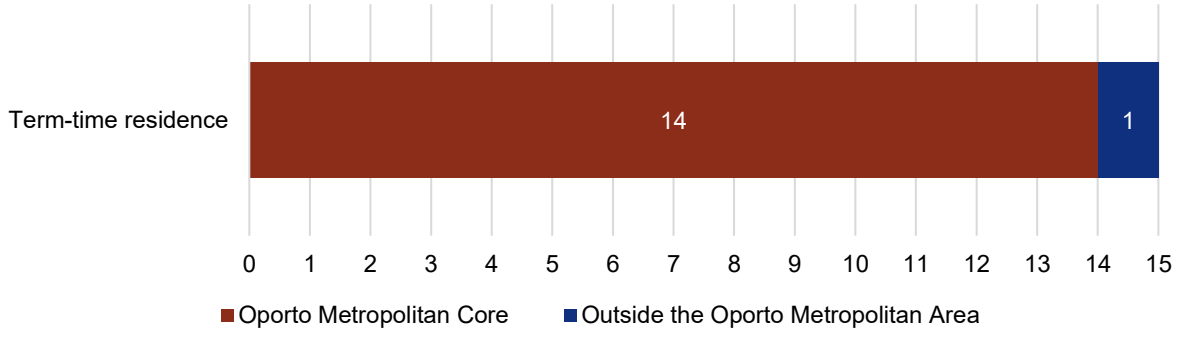


Figure 2 – Participants' demographic profile

In terms of studies, most participants are enrolled in Science, Technology, Engineering, and Mathematics (STEM) fields. Out of the 15 participants, 11 are enrolled in engineering programs, specifically Civil engineering (n=7), Electrical and Computer engineering (n=3) and Chemical engineering (n=1). The other three participants study Medicine, Cybersecurity and Psychology.

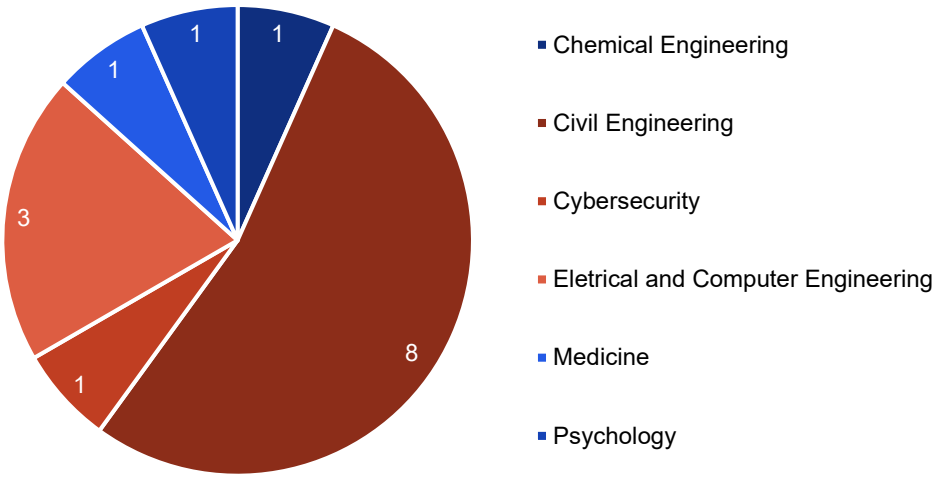


Figure 3 – Participants' academic profile

Table 4 – Semi-structured discussion guide

Purpose	**Question**
To get to know the participants and break the ice	1. Tell us your name, study or job function and whether you have a driver's license and/or own a car.
To begin the discussion	2. What are the first words, ideas, or feelings that come to your mind when you think about the car?
To understand the importance of owning a car within life goals	3. Rank the following life milestones from most to least important in your current stage of life: Buying a car; Buying a house; Getting a driver's license; Securing a stable job; Achieving financial independence; Moving out of parents' home; Travelling regularly; Pursuing a master's degree/postgraduate studies; Getting married; Having children
To understand future intentions regarding car ownership	4. Would you like to own a car soon? Why? 5. Which factor would influence your decision to own a car? (e.g.: Obtaining a car driver's license; Social influence (parents, friends, partner…); Financial status
To explore perception of car dependency and autonomy	6. Do you agree with the statement: "The only way to be independent and efficient is by owning and using a car."? Why or why not? 7. To what extent do you feel dependent on the car for your daily activities? 8. What is your opinion about the presence of cars in the city?
To understand perceptions about mobility and urban space	9. In an ideal situation, without financial limitations and without location constraints, where would you choose to live and which mode of transport would you choose? 10. Do you agree with policies that promote public transportation use?
To conclude and gather final reflections	11. Is there anything else you would like to share regarding cars, mobility, or the future of transportation

4
RESULTS

4.1 Longitudinal Trends in Driver's License Acquisition (2015-2025)

To understand mobility patterns among young adults in Portugal, this chapter begins by studying macro-level administrative data. Analysing the total number of new driver's licenses by year is an important step before evaluating the individual behavioural and psychological factors. The first dataset represents the total number of new driver's licenses annually among young adults from 18 to 24 years of age over an 11-year period from 2015 to 2025, and was provided by IMT.

A descriptive analysis of Figure 4 shows an overall decline in the absolute number of young adults getting a driver's license in Portugal, with a major disruption in 2020. Between 2015 and 2019, there was a steady decline. This gradual decline dropped significantly in 2020, due to the COVID-19 pandemic, falling from 94,896 to 70,451. This sudden drop was caused by administrative closures, mobility restrictions and suspended driving tests. After pandemic restrictions were lifted, a temporary surge occurred between 2021 and 2022, peaking at 96,422 new licenses. After 2022, the structural downward trend returned immediately. Between 2022 and 2025, licensing numbers fell from 96,422 down to 83,240. This post-pandemic decline suggests that the reduction is not temporary, but rather a long-term trend.

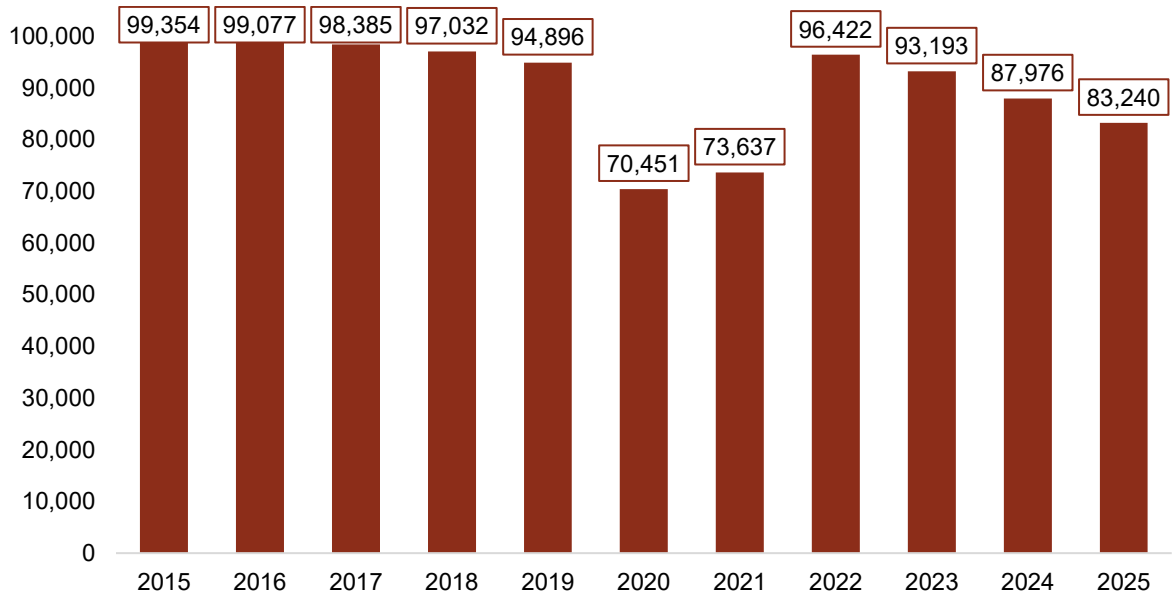


Figure 4 – Total annual number of new driving licenses in Portugal for the 18-24 age group (Source: IMT, 2015-2025)

While this raw data shows a clear decline in the number of new licenses by year, absolute numbers do not consider Portugal's changing demographics. To verify if this decline represents a genuine generational shift away from car culture or is simply the result of a shrinking population (due to the decline in national birth rates), these numbers must be compared against official population data.

Therefore, using data from INE, a new driver-to-population rate was calculated. This rate measures the ratio of new driving licenses issued to individuals. The initial rate of 10.0% (Figure 5) indicates that approximately one in every ten individuals aged 16 to 24 obtains a driver's license. Adjusting proportionally for the specific distribution of ages, this translates to 13 individuals out of 100 aged 18 to 24 obtaining a license.

It is important to note that the demographic data available contained an age group from the 16-to-24 age category. In contrast, the administrative licensing data provided by IMT isolates individuals within the 18-to-24 age group. Including the 16 to 17 age group does not compromise the results, since it acts as a constant systematic error across the entire timeline.

Therefore, the downward shift observed in Figure 5 is driven by the active variable: the young adult's decision to get a driver's license once they reach the legal age. Between 2015 and 2025, the ratio of new driving licenses in Portugal fell from 10.0% to 8.5%. As mentioned above, this translates into a decline from 13 out of 100 to 10 out of 100, considering the proportion to the 18-to 24-year age group. While the pandemic disrupted in 2020 (-26.3%) followed by a recovery in 2021/2022 (+29.7%) the structural trajectory remains negative.

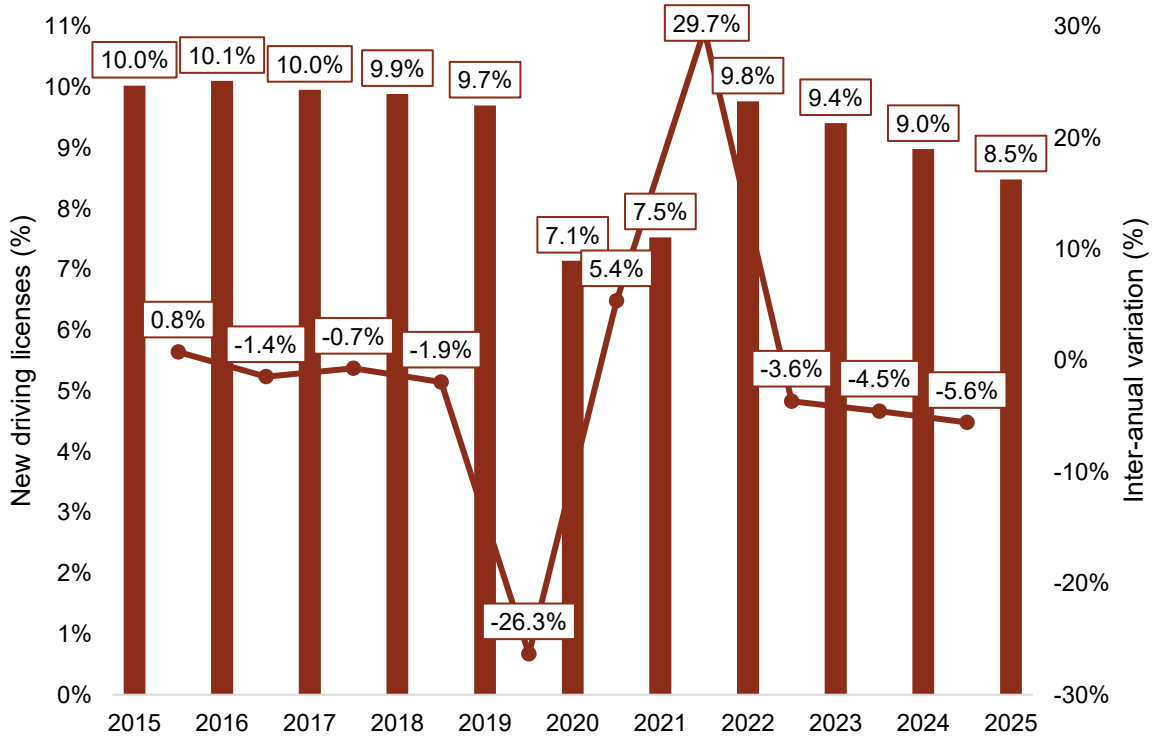


Figure 5 – Variation of new driver's licenses rate in Portugal for the 16-24 age group (Source: IMT, 2015-2025)

4.2 Car Use Analysis

Although it's possible to observe an increase in car use throughout the years, the growth rate is drastically decreasing. Starting as a small percentage of commuting trips in 1981 (Figure 6), representing only 12% of daily travel for workers and 3% for students, it quickly gained popularity, with the biggest growth between 1991 and 2001. However, as mentioned in the literature, the growth rate indicates a stabilisation in car use in recent decades, with only 6% and 7% in 2021.

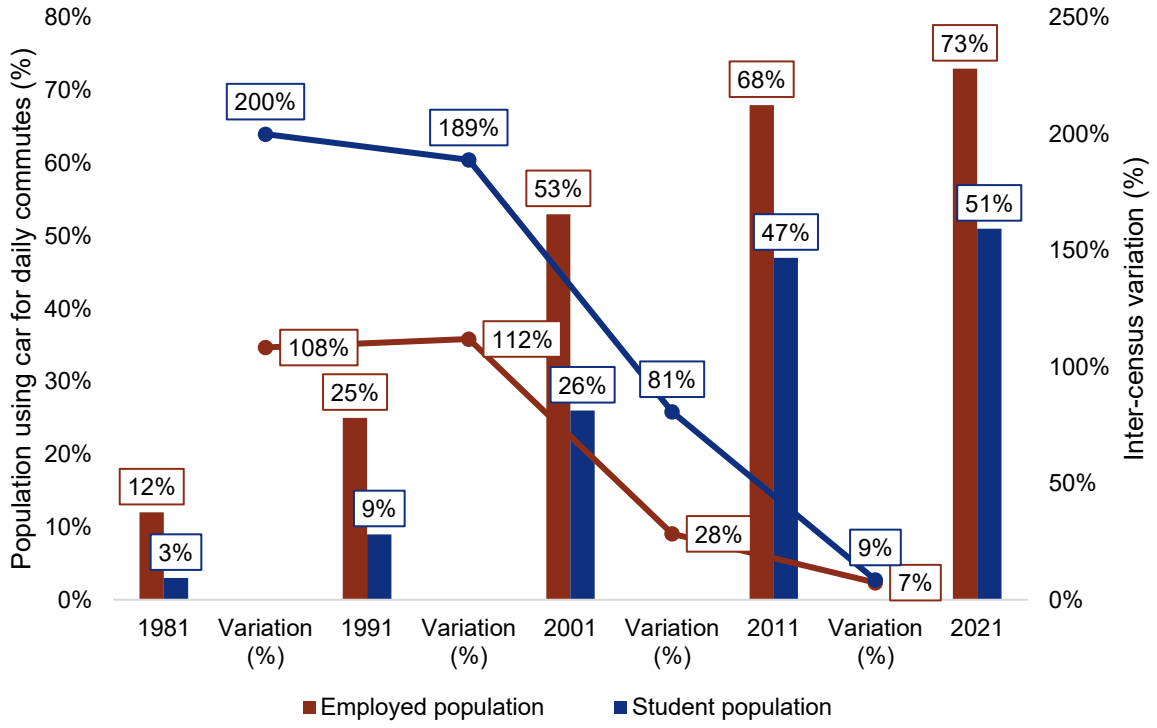


Figure 6 – Evolution of car use among Portuguese population (Source: INE, Censuses, 1981, 1991, 2001, 2011, 2021)

When analysing the age group between 16 and 24 years old (Figure 7), the results are similar to the general population. It's possible to observe a slower growth in car use each year. However, when comparing the percentage of car use, there is a bigger gap between workers and students. For example, in 2021, 67% of the employed population used the car on daily trips, compared with 34% of the student population. Young people use the car slightly less than the general population for both school and work trips.

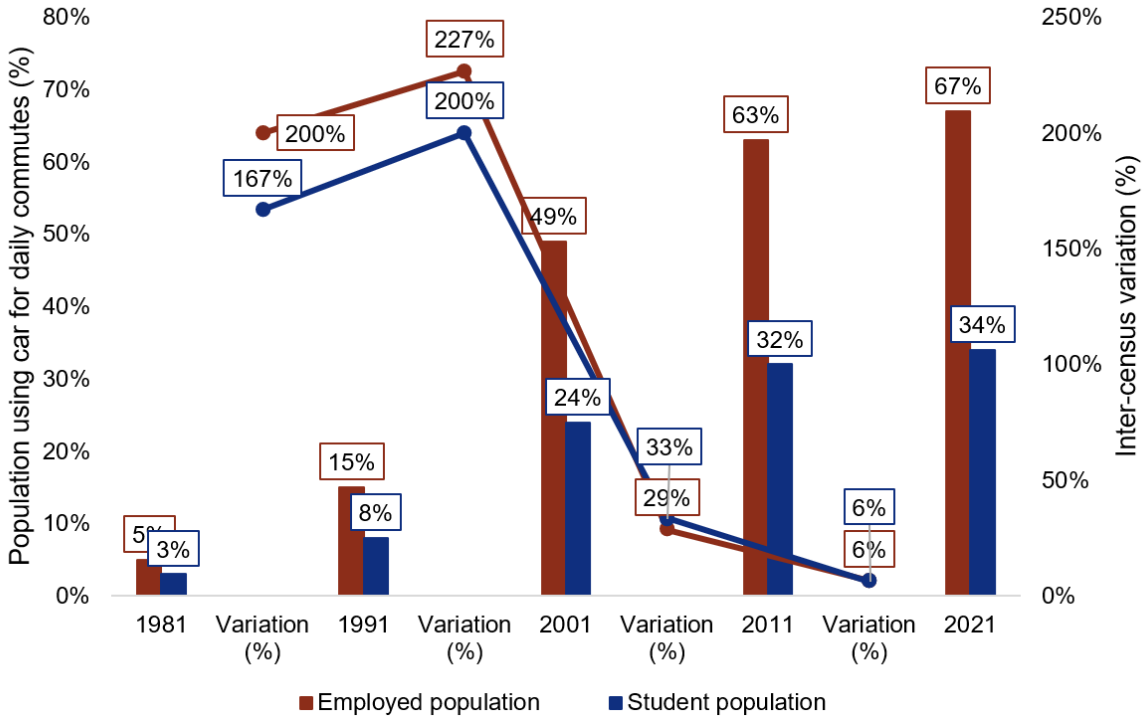


Figure 7 – Evolution of car use among the 16-24 age group (Source: INE, Censuses, 1981, 1991, 2001, 2011, 2021)

Since the study, including the focus group and interviews, was developed in collaboration with students at the University of Porto, it's important to provide a more localized analysis. Thus, having in consideration the Porto Metropolitan Area, the information was filtered to correspond solely to the following 17 municipalities: Arouca, Espinho, Gondomar, Maia, Matosinhos, Oliveira de Azeméis, Paredes, Porto, Póvoa de Varzim, Santa Maria da Feira, Santo Tirso, São João da Madeira, Trofa, Vale de Cambra, Valongo, Vila do Conde and Vila Nova de Gaia. When comparing Porto Metropolitan Area, the percentage of car use is similar to the national among the student population, representing 54%. However, among the employed population the car percentage use represents 74% over all the modes of transportation, contrary to the 51% national.

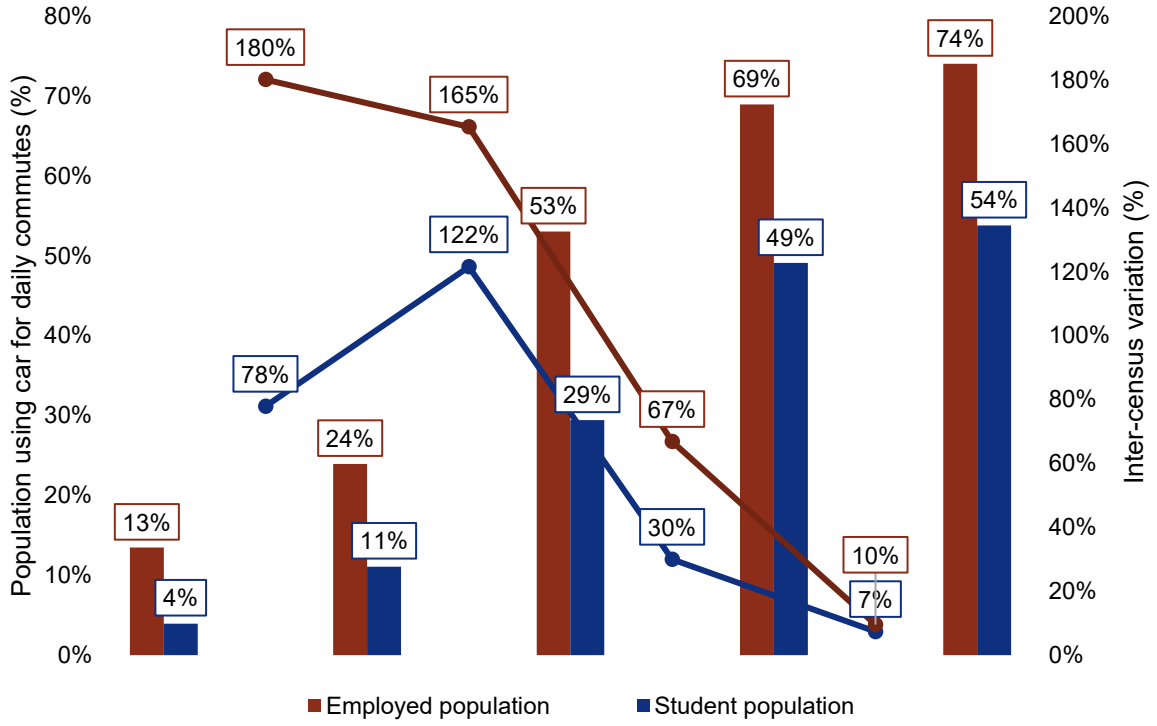


Figure 8 – Evolution of car use for commuting to work or school in in Porto Metropolitan Area (Source: INE, Censuses, 1981, 1991, 2001, 2011, 2021)

For those among the 16-24 age group in Porto Metropolitan Area (Figure 9), the percentage are closer to the national average, although still higher when comparing the employed population. When analysing the growth rate, the variation among students has stagnated, representing a variation of 11%, and 8% of percentual variation from 2011 to 2021, for the workers.

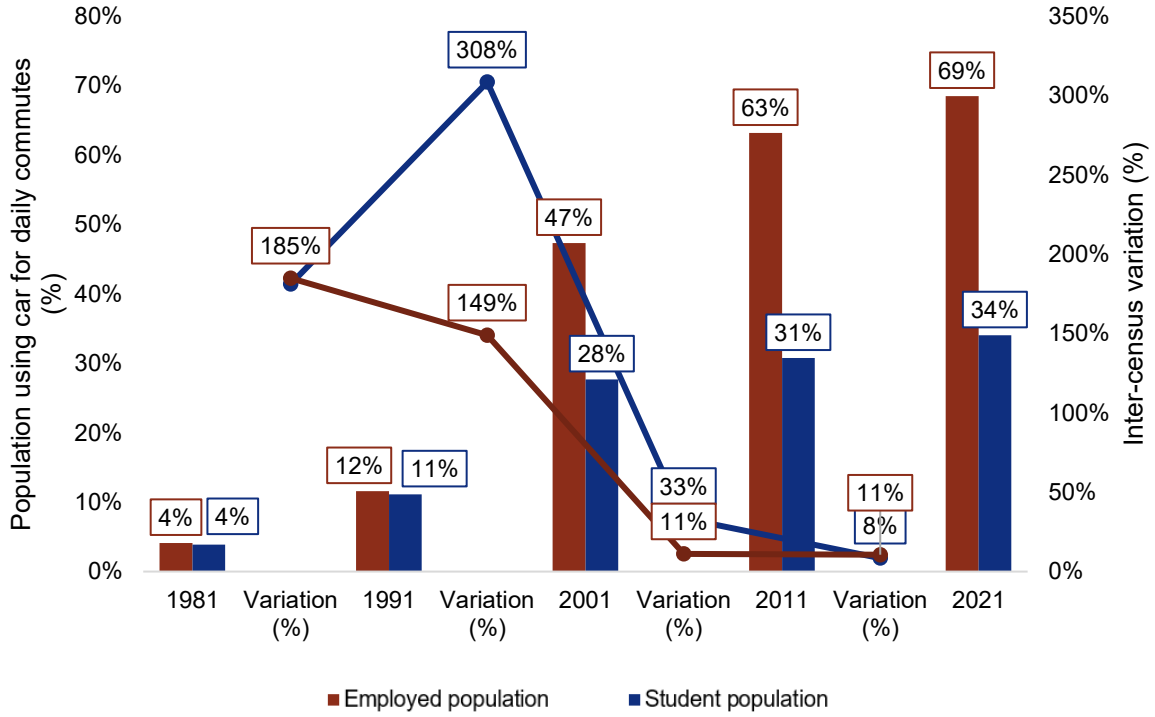


Figure 9 – Evolution of car use for commuting to work or school among the 16-24 age group in Porto Metropolitan Area (Source: INE, Censuses: 1981, 1991, 2001, 2011, 2021)

The data suggests that entering the workforce is the main determinant for car adopting among young people. However, young adults students show a lower car dependency than overall student body, with car use stabilizing after 2011.

4.3 Focus Group and Interviews

4.3.1 Participants characterization and behaviours

The data, presented in Figure 10, shows a clear difference between having a driving license and having a car available to use. Within this sample, holding a driver's license is nearly universal, 13 of 15 participants, and the two participants that do not hold a driver's licenses are in the process of holding one. However, actual access to a vehicle divides the group. While eight of 15 participants have regular access to a car, the other seven show a bigger dependence on other modes of transportation. This group without vehicle access includes two participants who are still learning to drive, but it also includes five licensed drivers who do not have a vehicle available. This division is important because it creates distinguish between students who can choose to drive and those who must rely on alternative transport methods, such as public transport or walking, for their daily travels.

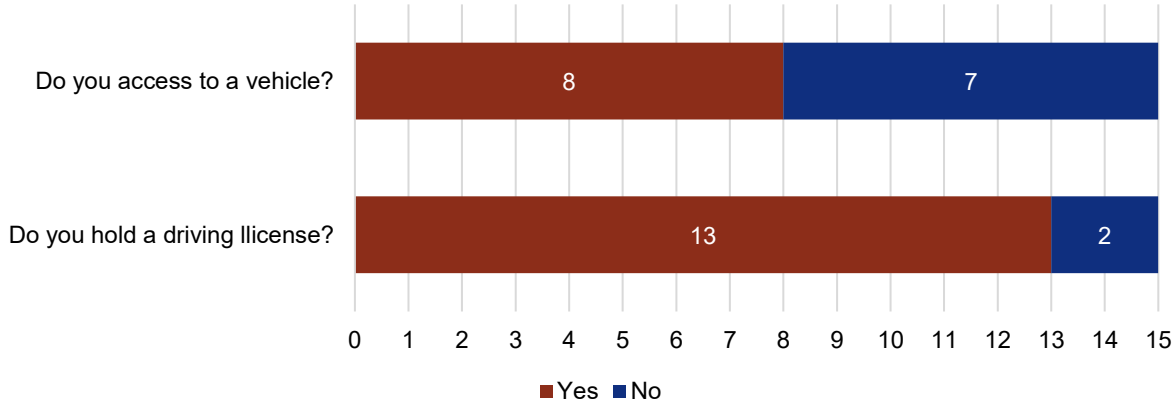


Figure 10 – Licensing status and vehicle availability

An analysis of public transport perceptions, Figure 11, reveals a clear split among the 15 participants regarding adequacy. When asked about the transit connection between their home and the university, nine of 15 participants consider the offer to be adequate for their commute, while two participants experience a network that works in one direction only.

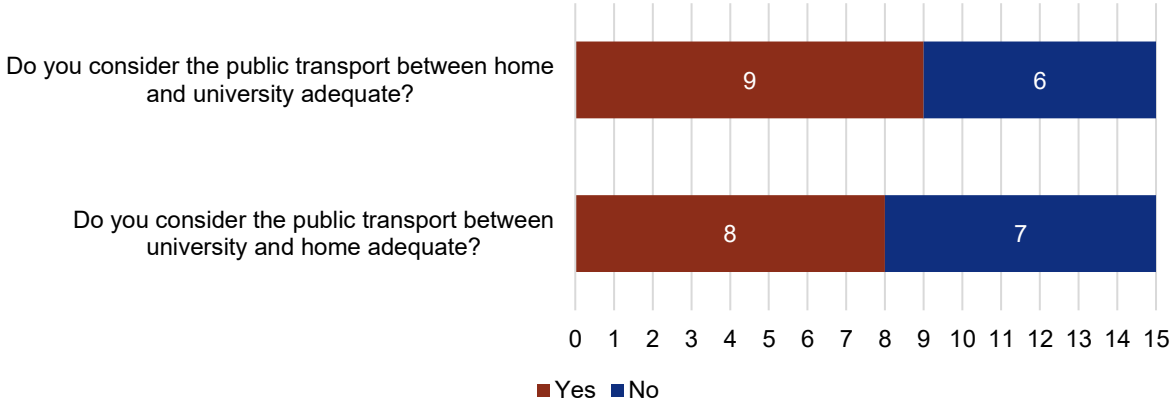


Figure 11 – Public transport adequacy

For most participants, car use is associated with leisure, travelling outside the city, shopping and travelling during rainy weather, as it's possible to observe in Figure 12. However, for five of 15 participants, the car is a regular necessity for daily commutes. Three of 15 participants do not use the car at all in their current routines. The data also shows a wide variation in willingness to walk before choosing to drive. While one participant is only willing to walk up to five minutes, most participants show more availability, generally accepting times between 15 and 20 minutes and some accepting walks up to 30 or 45 minutes.

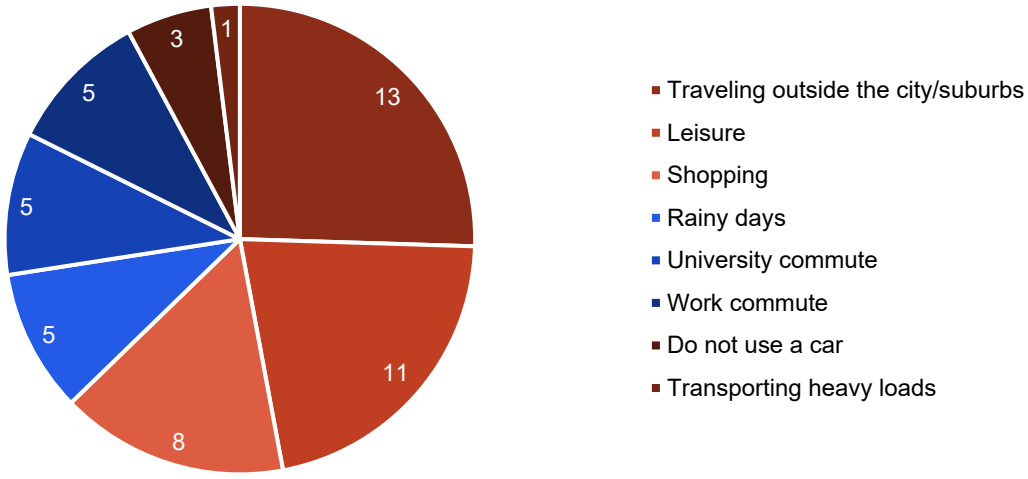


Figure 12 – Car usage habits

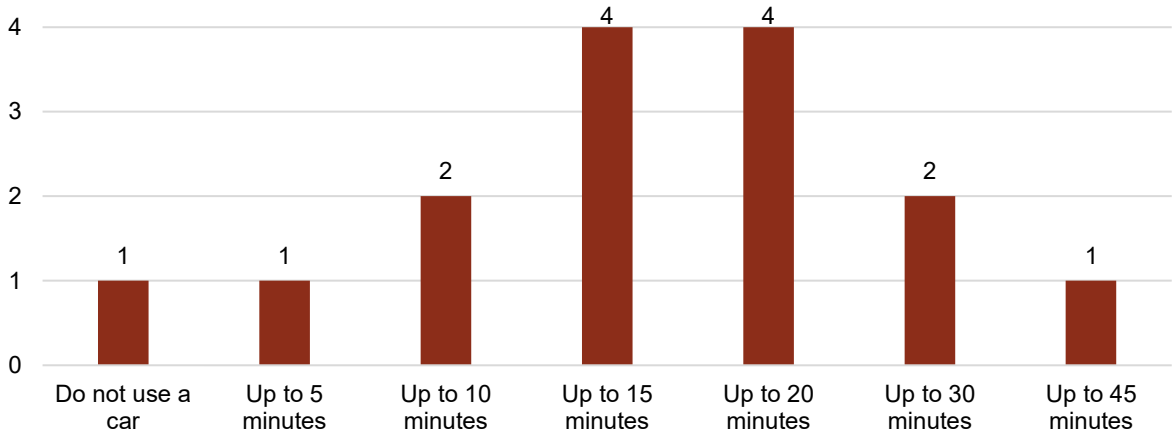


Figure 13 – Walking tolerances

The comparison of past and current primary modes of transportation, represented in Figure 14 and Figure 15, shows a clear shift away from car dependency for several participants. As teenagers, Figure 14, car travel was dominant: 11 of 15 participants relied mainly on cars for the school commute, and 12 of 15 participants replied that the car was the primary mode of transportation for other trips, related to extracurricular activities, leisure, etc.

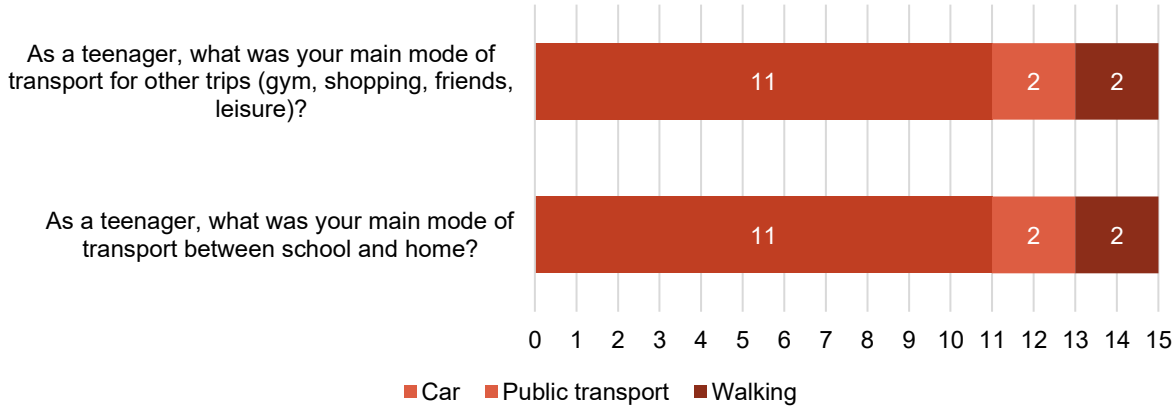


Figure 14 – Teenage years primary transport modes

In their current life, Figure 15, participants show less reliance on the car and more diverse mobility choices. For daily commutes, walking has become the most common option, chosen by seven of 15 participants. The number of participants choosing the car has dropped to five of 15 participants. The remaining students rely on public transport or ride-hailing services.

A similar trend is shown in non-academic trips. While six of 15 participants use a car as their main mode, others have shifted to alternative choices: six of 15 walks as their main mode, two rely on public transport and one uses a motorcycle.

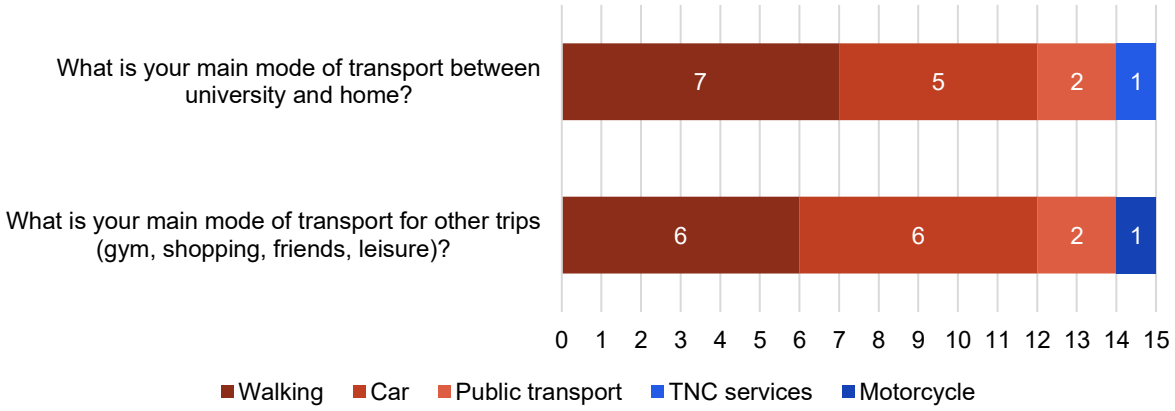


Figure 15 – Current primary transport modes

4.3.2 General ideas of the car

The first part of the focus groups and interviews was characterised by a crucial element used to introduce and open the conversation. When asked about the first thoughts when thinking about the car, participants revealed diverse opinions and perceptions. Eleven participants shared overall a positive perception associating the car with comfort and privacy, liberty and autonomy, the feeling of "not being tied down to anything" and convenience, "the general idea of getting where I need to go quickly". Some participants also mentioned amusement and leisure.

On the other hand, four participants had mainly negative perceptions, mentioning worries, irritations, and anger associated with traffic in general, difficulties with parking, and, on a more environmental note, pollution. One participant described that while driving, people are more aware of their surroundings, mentioning that, while taking the bus, "you are just sitting there" and have no perception of the traffic and its "chaos". This perception can be associated with the fatigue caused by driving.

Expressing a broader perspective on urban quality, Participant #2 defined city liveability around car independence asserting that "one of the main points of what makes a good city [is] "Do you need a car? No" […] that's a way of judging how good a city is, the quality of life in a city, is whether or not you need a car.".

4.3.3 The importance of owning a car within life goals

The analysis of life milestones ranking, Figure 16, reveals the importance of car ownership in a future perspective. While "Getting a driver's license" is perceived as an essential life step, with 14 of 15 participants ranking it as their number one priority, car ownership was relegated to the bottom half of the participants' priorities (n=10). The data shows how the participants focus primarily on establishing a solid socioeconomic foundation. Milestones such as "Pursuing a master's degree/postgraduate studies", "Securing a stable job" and "Achieving financial independence" consistently dominate the upper-middle ranking.

Most of the participants referred to the automobile as a financial burden rather than a symbol of success. Reinforcing the perception of vehicles as depreciating assets rather than financial investments, Participant #2 explicitly compared purchasing a car to buying electronics, noting that "the car is an investment that never pays off […] everyone knows after two years is no longer the same thing. It's like buying a phone.". Some pointed out the priority is to achieve financial independence and move out of their parent's house. This matches the study (Simons et al., 2014), where it's identified how financial costs are a major barrier to car use and ownership among young people.

Even though most participants do not prioritise owning a car, there is a clear expectation in the data. Four participants ranked "Buying a car" as their second most important goal, right after obtaining a driver's license. However, these participants did not rank social status highly. Instead, they perceive the car as practical and needed to reach other life goals. When ranking the life milestones, one participant mentioned "Get a license", "Buy a car" to be able to go to work and "Get a stable job", reinforcing the need for using the car in daily commutes, considering the participant is living outside the Porto Metropolitan Area. For these participants, especially those living in areas with poorer public transport, having a car is essential.

Interestingly, while young adults are currently delaying both car ownership and starting a family, these two goals are closely linked in their future. During the interviews, participants said that "having children" would be the main reason to obtain a car.

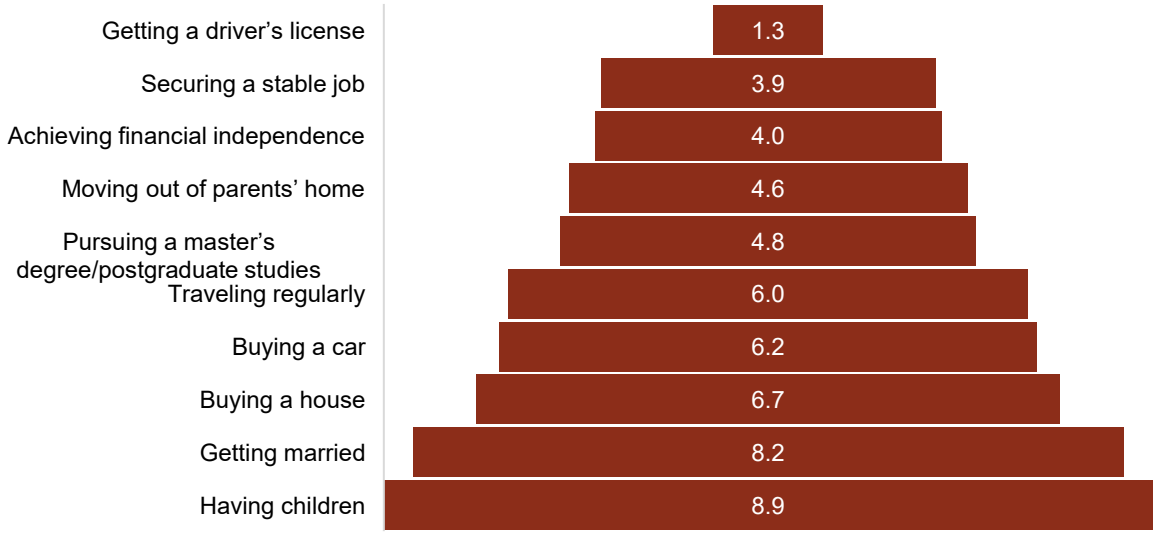


Figure 16 – Average of participants' life milestones priorities

4.3.4 Future intentions regarding car ownership

Analysis of plans regarding car ownership shows a clear consensus: most participants do not intend to buy a car anytime soon. Most participants who already use a car daily see no need to buy a new one, hoping their current car lasts as long as possible. The participant who mentioned the desire to buy a new car justified it by saying they need a bigger car, since the one they own now has only two seats. For those without a car, buying one is seen as a heavy financial burden and bad investment, as mentioned before. One participant shares this view, noting that a car is completely out of their plans unless it is gifted to them.

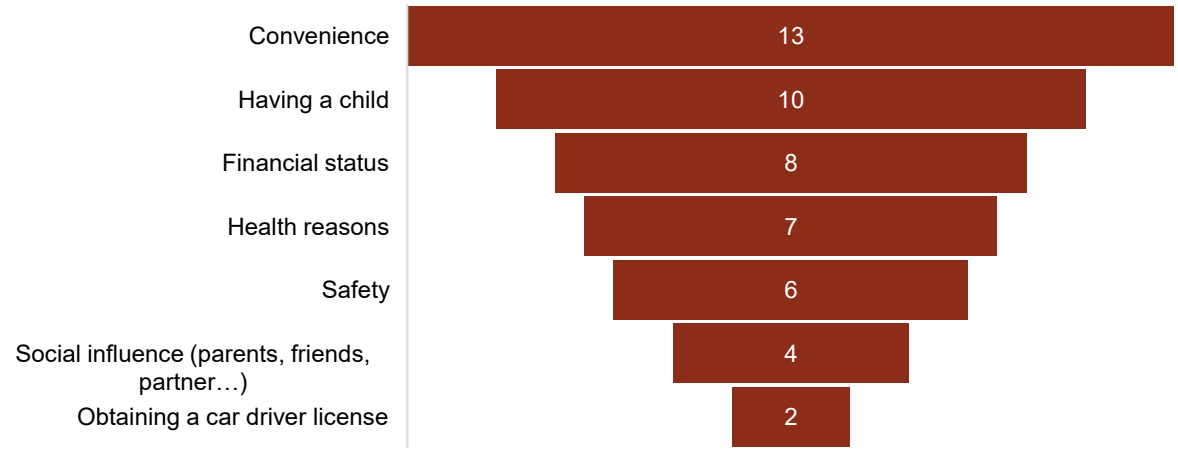


Figure 17 – Factors for car ownership

4.3.4.1 Convenience

When evaluating the factors that would influence a car purchase (Figure 17) "Convenience" emerged as the primary motivator, selected by 13 of 15 participants. However, the interviews and focus groups revealed that this convenience is linked to public transport degradation and failure. Participants justified this requirement by highlighting the unreliability of public transport, mentioning the "lack of alternative". One participant noted that they frequently rely on ride-hailing services because inefficient public transport turns a 15-minute car journey into a one-hour bus trip. Consequently, future vehicle purchase is driven by a fundamental need for time efficiency and personal autonomy.

Comparing her international mobility experiences during exchange programs with the reality of Portuguese networks, Participant #14 highlights the psychological frustrating of returning to local infrastructure, stating that in other European cities "public transit worked so well that I thought "indeed, a car is not necessary" […] and then you arrive in Portugal and I feel almost like trapped […] because it feels like I can't go anywhere.".

4.3.4.2 Having a child

The perspective of starting a family alters their perspective. “Having a child” was identified by ten participants as a trigger for buying a vehicle. The interviews and focus groups suggests that when children enter the equation, a car transitions from a financial burden to a logistical and safety necessity. One participant described a personal vehicle as “essential” for raising children, while another mentioned they could not “imagine having a child before owning a car”. Furthermore, participants emphasised the logistical challenges and the advantage of using a private vehicle to protect children from illness in crowded public spaces. However, one participant doubted whether the car is truly necessary for the children, noting that they “wouldn’t want [their] kid growing up in the back seat of the car” (Participant #12).

4.3.5 Financial and work-related factors

Work-related factors play a significant role in future ownership plans. Several participants explicitly cited it as a main motivation. Entering the labour market, especially in careers that require travelling to remote locations or construction sites, makes a vehicle a mandatory professional tool. Eight participants identified “Financial status” as an influencing factor, not from a luxury, status-symbol perspective, but as financial stability being a necessary factor. They intend to delay acquisition until their income is steady enough to absorb the ongoing costs of fuel, maintenance, etc. However, one participant (Participant #12) pointed out how reaching economic stability does not automatically justify buying a vehicle: “When I achieve financial freedom [instead of] spending money on a car, I can spend it on something else that might be much more interesting to me.”.

4.3.5.1 Safety

For several participants, a personal vehicle represents a safe environment that protects them from external threats. Notably, safety was a priority for all female participants in the study. One female participant highlighted that a car provides security by avoiding vulnerable situations, such as "waiting at a bus stop at night" (Participant #1). Another female participant (Participant #14) agreed, mentioning "if I worked in a dangerous neighbourhood, going by car or motorcycle [allows me] to park right at the work entrance instead of having to walks thought the entire neighbourhood.". The concern demonstrates that personal safety, especially for young female adults, is a major driver of future car ownership.

4.3.6 The perception of car dependency and autonomy

When asked "The only way to be independent and efficient is by owning and using a car." most participants rejected the absolute statement, separating it into two concepts, as it's possible to observe in Figure 18. For most participants, it is entirely possible to be independent without a car by walking, cycling, using public transport, or relying on ride-hailing services. However, almost everyone agreed that the car remains the most efficient choice for managing time.

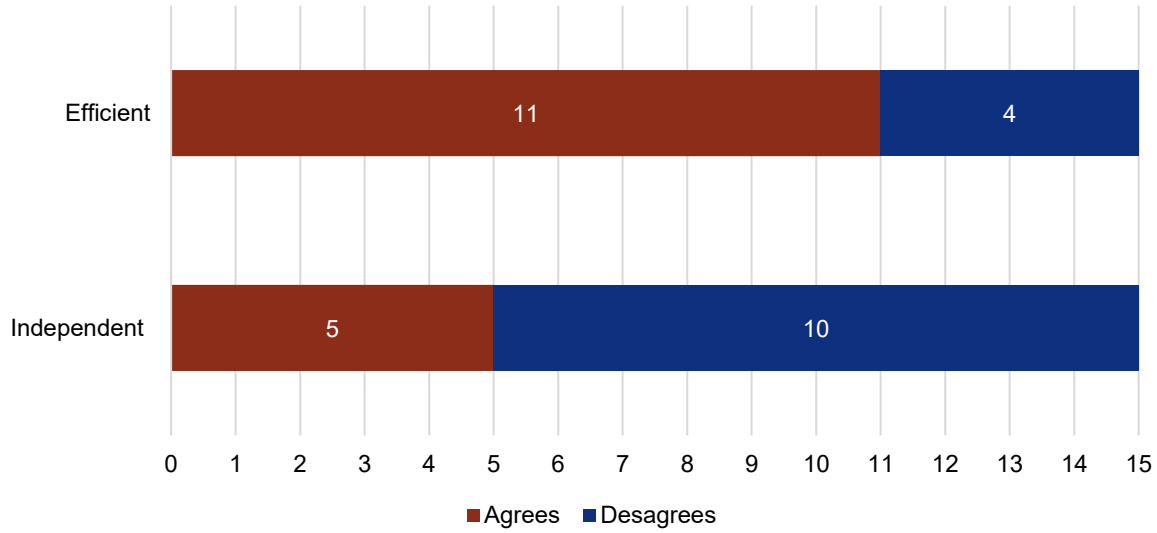


Figure 18 – Independent and efficiency of owning a car

When asked directly about their dependence on the car, Figure 19, the responses differ based on location. Participants living and studying in central city areas (such as downtown Porto) reported no dependence on the car. One participant noted that they felt no need for the car in the city, adding that traffic would make it a worse option. Another participant shared this view, feeling completely independent on foot, by bicycle or using the metro and argued that cars are the "least efficient" mode of transport in dense urban centres (Participant #2).

Those living in peripheral areas or smaller cities reported a bigger dependence on the car. Two participants (Participants #1 and #8) admitted that while they can live without a car in Porto, they are "very dependent" in their smaller hometown. Another experienced the exact same contrast, being independent in a large city but highly dependent in a smaller region because the poor transit network forced them to rely on ride-hailing or family rides.

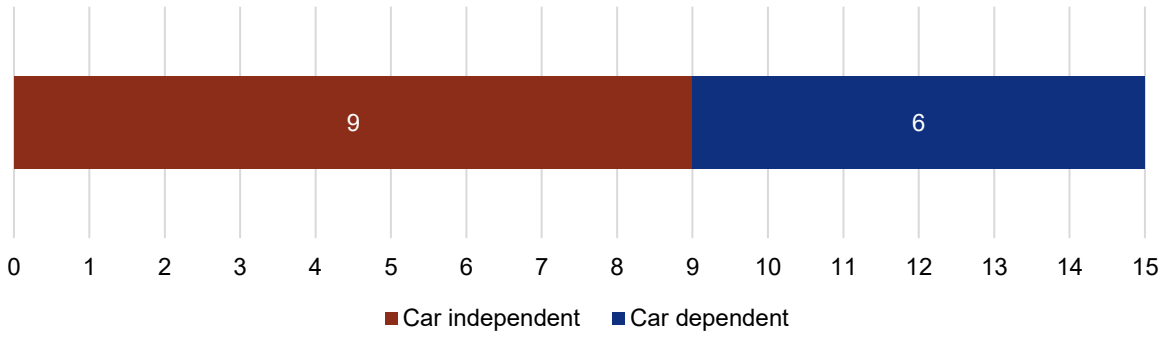


Figure 19 – Dependence on the car

The interviews and focus groups highlighted how unreliable public transportation demotivates participants. One participant argued that transit delays destroy personal independence: "The moment you have a schedule, but they don't follow it, your independence is gone because you can no longer make a decision the fact that the bus doesn't show up leaves you completely lost.", admits Participant #5. When buses skip schedules or arrive full, it creates structural anxiety.

Critiquing also schedule inefficiencies and their impact on daily well-being, Participant #1 mentioned how "the main problem with public transit is that it is still not completely optimized […] People have to resolve their lives around transport […] after a certain hour there are no more buses, or [a trip] requires leaving an hour in advance. For me, that's no quality of life.".

Although the car is perceived as flexible, allowing drivers to “go anywhere, anytime” (Participant #6) without being tied to a schedule, participants recognise that car ownership creates its own form of dependence. Participant #6 pointed out how bringing a personal vehicle to a destination restricts subsequent travel choices, noting that “if you go somewhere by car, you automatically become dependent on bringing it back […] and that limits you in everything else.”. Additionally, the car's efficiency is weakened in urban environments by traffic congestion. Participants described frustration in dense traffic zones, noting that on days they avoid traffic, they cannot find parking when arriving at the university. Unexpected accidents and peak hours frequently erase the time-saving benefits of a car.

4.3.7 Perceptions about mobility and urban space

When asked about having cars in urban centres, almost all participants responded negatively (8 out of 15, Figure 20). Participants show a deep awareness of the negative impacts of excessive car traffic, especially regarding noise pollution and mental health, showing a strong

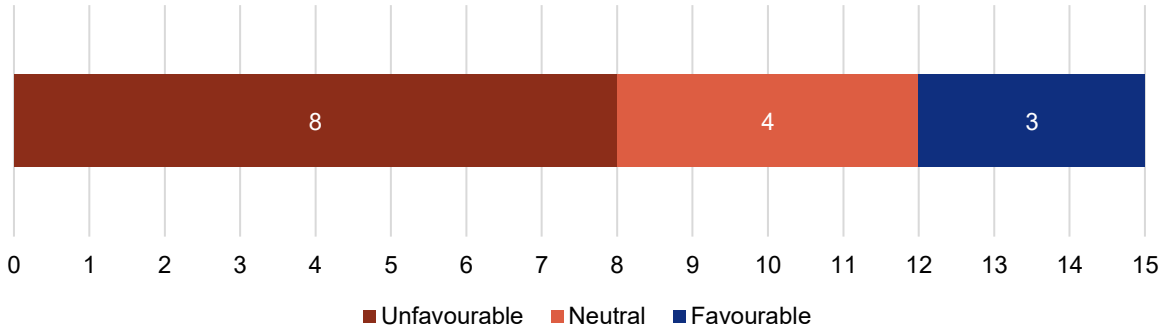


Figure 20 – Perception of cars in urban centre

One participant directly linked heavy traffic and busy roads to worse mental health, noting that traffic noise negatively affects rest and night-time sleep. Additionally, participants recognise that car use urban space inefficiently. Another participant (Participant #12) pointed out how city centres were never built for cars: “I don’t like having cars in the middle of the city because [it] was never made to have cars […]. And the streets were [later] adopted to accommodate the car.” adding that “More and more, and with the increase of tourism, particularly in the case of Porto, which results in more and more people walking around, makes it more dangerous to have people in the middle of the city alongside cars, because there are many conflicts between pedestrians and cars”. A third participant (Participant #2) shared this view, arguing that cars (even electric ones that do not emit local pollution) make cities completely dysfunctional during rush hours due to high traffic volume. Overall, participants see the space dedicated to driving and parking as disproportionate and harmful to a peaceful urban life.

Those who answered this question neutrally pointed out the necessity of having cars in urban centres but defended a balance, mentioning that "The car is important, but not in excess either. We must have a middle ground, managing to get more people to arrive in Porto via public transport, even if it means building parking lots outside the city and then bringing people […] by bus." (Participant #3). This participant revealed using the car in their daily life, mostly out of necessity, which can be correlated with this opinion, and a lack of public transport access in their residential area, even though it's situated inside the Porto Metropolitan Area.

However, those who mostly disagreed with the share of space dedicated to the car indicated issues such as reduced car parking space, traffic, necessity and liberty. One of the participants mentioned how "the presence of the car is important for people to have liberty to move around whenever they want, without having to wait for public transportation schedules" (Participant #9). Two out of the three participants who had a positive opinion about the presence of cars in cities use the car in their daily life, and one of the participants is from outside the Porto Metropolitan Area, which can influence this perception of necessity and obligation.

Participants were asked to describe an ideal scenario where they could choose where to live and how to travel without any budget limits. The main goal for these young adults is to reduce daily commuting travel. One participant stated that their ideal scenario would be having their home and job within walking distance, pointing to European cities. One participant clearly mentioned that they would give up the luxury of a suburban house with a pool to live in a city apartment, arguing that suburban luxuries do not make up for the time lost in traffic jams.

Regarding policies to promote public transportation, most participants agreed they are necessary. The data shows that purely financial measures such as free passes are not enough if the network itself is poorly structured. Some participants argued that offering free transport to the entire population takes away vital funding that should be used to expand routes, increase frequency and prevent cancelled schedules, especially in peripheral areas. Another participant added that forcing people to give up their private car does not work unless there is serious, prior investment to create public transit alternatives that are safe, fast and predictable.

5
CONCLUSION

5.1 ANSWERING HYPOTHESES

5.1.1 General hypothesis

H: Younger generations are reducing car usage.

The quantitative data partially confirmed a decline in car use among young people. The quantitative analysis reveals a structural shift away from early car orientation, though car usage remains strong.

Data from IMT showed a drop in the number of new driver's licenses. Although there is a rise in licensing after COVID-19 restrictions were lifted in 2021 and 2022, the decline resumed immediately after. This proves that the drop is a generational shift rather than a temporary change.

Additionally, historical census data from INE showed a decline in the growth rate. The data also shows a strong correlation between life stages and car use. In 2021, within the Porto Metropolitan Area, 74% of working people used a car for their daily commute, compared to only 54% of students.

These findings indicate that while young adults particularly university students are actively delaying licensing and maintaining lower car dependency during higher education, when compared with the working population.

Financial factors

H1: Younger generations are more aware of the financial burden of car ownership.

The first hypothesis focused on whether participants are highly aware of the high costs of owning a vehicle or they perceive it as a financial burden. Participants prioritised building a stable financial foundation, finding a steady job and becoming financially independent over buying a car. Most saw the car as a poor financial choice, describing it as an “investment that never pays off” and comparing its immediate depreciation to buying a smartphone that loses its value the second it is purchased. They recognise the price of maintaining it as “too expensive” and a continuous loss that requires a solid economic base to absorb costs like fuel, parking and maintenance.

5.1.2 Social and Lifecycle Shifts

H2: Younger generations are delaying overall emancipation.

The second hypothesis examines the perspective of the car when it comes to its association with social status or a main symbol of adulthood. Most participants confirmed that cars are no longer associated with these two images. However, future car ownership is still strongly linked to specific milestones. Most participants noted that “having a child” is a critical event that turns a car from a financial burden into an absolute logistical and health necessity. Starting a career, especially one that requires travelling to remote areas, is another main reason to buy a vehicle. Despite the consensus regarding family formation, some participants demonstrated a critical awareness of the downsides of a car-dependent life, noting that they “wouldn’t want their kid growing up in the back seat of a car”. Overall, participants are intentionally delaying car ownership for as long as possible until these major life events make it mandatory.

5.1.3 Social and Utility Preferences

H3: Younger generations prioritise experiences over material assets.

The third hypothesis explored how likely participants were to choose experiences over buying a car, which is partially confirmed. “Travelling regularly” was prioritized over “Buying a car”, reflecting a cultural shift away from viewing private vehicles as status symbol. However, this hypothesis is structurally constrained because severe public transit inefficiencies frequently override the personal preferences. Some participants demonstrated dependence on car use for lack of other appropriate options for participants location or life style.

5.1.4 Additional conclusions

Personal safety was also a major reason for wanting a car, especially for female participants. They viewed cars as a safe environment to avoid risky situations, such as waiting at bus stops at night or crossing less safe neighbourhoods. Some participants showed intentions to move to suburban or more remote areas to raise a family and recognised the need for a car in that case.

Furthermore, participants strongly disliked car-centric cities, mentioning negative impacts on mental health, high noise levels and the wasteful use of urban space. Some note that historic city centres were not built originally for cars and that their overwhelming presence makes urban areas dysfunctional. Their ideal living scenario favours walkable, central locations, mentioning the “15-minute city” concept. Despite this, many are still forced to depend on cars. This reliance is mainly caused by poor and unreliable public transportation, which reduces personal freedom.

In addition, the findings of this study offer important lessons for future transportation policies. Young adults agree that financial incentives, such as free public transit passes, are not enough to promote public transportation use. To successfully reduce car use, policymakers must invest in improving infrastructure. Convincing people to give up private cars requires creating public transit options that are naturally safe, efficient and reliable, especially in suburban areas where car dependency remains high.

5.2 LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH

Despite the findings, this dissertation presents some limitations that should be noted, such as the small and limited sample and mismatch in the data sample. The qualitative research was limited to 15 participants aged 21 to 25, mostly living in the Porto Metropolitan Area. Since this is the first study in Portugal on this topic, and due to time constraints, the research was designed as an exploratory investigation. Consequently, the results should be viewed as a starting point for future research, offering hypotheses to be tested in larger and more representative studies.

Furthermore, the group was very similar in educational background, as 11 of the 15 participants were studying STEM fields, specifically engineering. Because of this, these insights do not fully address this generation itself, and its diverse financial and cultural realities. Another notable limitation of this study was the inability to recruit participants who completely lacked a driving license or had no intention of obtaining one. Due to time constraints and the small sample size of only 15 participants, the data fails to capture the unique perspectives of young adults who reject car use.

The quantitative data contained a statistical mismatch when comparing IMT and INE data, as addressed before. The demographic data from INE grouped youth between 16 and 24 years old, while the licensing data from the IMT specifically investigated 18 to 24 years old. While this does not change the main downward trend, it means the mathematical comparison is not completely exact.

Based on these findings and limitations, several areas for future research are recommended to better understand this generational shift. Longitudinal studies following young adults regarding career transitions would help explain how finding a job might force young generations to get and rely on cars. Expanding the geographical sample to rural areas would identify areas with a more prevalent dependency on the car.

Participants who used the car on a daily basis identified the lack of networks and/ or degradation of public infrastructure as one of the main reasons for their necessity and dependence. Future research would benefit from a stronger correlation between quantitative and qualitative data. Understanding and linking household locations with perceptions of car dependence and public transport would strengthen the qualitative data. It would also be interesting to analyse and compare habits with perceptions to understand if the perceptions of the car truly influence its use and dependence. Crucially, studies should distinguish between "choice users" (who voluntarily opt for the car) and "captive users" (who are structurally constrained by transit deficits).

Future research should evaluate also the growing role of ride hailing services (TVDE) and even integrating quantitative environmental data such as greenhouse gas (GHG) emissions and road safety data.

Since most female participants highlighted personal safety as a top reason for owning a car in the future, it would be intriguing to explore gender and urban safety dynamics. The correlation between gender, safety and transit choices should be a future research topic to improve urban design and create more inclusive and safe cities.

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APPENDIX

Table 5 – Evolution of car use for commuting to work or school in Portugal (Source: INE, Censuses: 1981, 1991, 2001, 2011, 2021)

	Employed population				Student population			
Year	**Total**	**Car use**	**% of car use**	**Percentage variation**	**Total**	**Car use**	**% of car use**	**Percentage variation**
1981	3,729,627	465,083	12%	-	1,669,301	54,159	3%	-
1991	4,011,680	998,218	25%	100%	1,745,514	157,512	9%	178%
2001	4,478,887	2,363,088	53%	112%	1,587,024	412,558	26%	188%
2011	4,030,448	2,753,498	68%	29%	1,890,083	893,727	47%	82%
2021	3,805,165	2,761,442	73%	6%	1,643,619	833,328	51%	7%

Table 6 – Evolution of car use for commuting to work or school among the 16-24 age group in Portugal (Source: INE, Censuses: 1981, 1991, 2001, 2011, 2021)

	Employed population				Student population			
Year	**Total**	**Car use**	**% of car use**	**Percentage variation**	**Total**	**Car use**	**% of car use**	**Percentage variation**
1981	792,255	38,837	5%	-	254,197	7,974	3%	-
1991	727,706	105,622	15%	196%	416,734	34,976	8%	168%
2001	594,678	292,882	49%	239%	472,064	112,619	24%	184%
2011	283,062	178,555	63%	28%	476,544	151,042	32%	33%
2021	220,573	148,778	67%	7%	492,909	168,641	34%	8%

Table 7 – Evolution of car use for commuting to work or school in Porto Metropolitan Area (Source: INE, Censuses: 1981, 1991, 2001, 2011, 2021)

	Employed population				Student population			
Year	**Total**	**Car use**	**% of car use**	**Percentage variation**	**Total**	**Car use**	**% of car use**	**Percentage variation**
1981	574,303	77,299	13%	-	255,972	10,131	4%	-
1991	729,863	174,755	24%	78%	282,895	31,369	11%	180%
2001	804,552	426,785	53%	122%	278,220	81,855	29%	165%
2011	683,882	471,578	69%	30%	328,111	161,078	49%	67%
2021	660,152	488,834	74%	7%	278,399	149,743	54%	10%

Table 8 – Evolution of car use for commuting to work or school among the 16-24 age group in Porto Metropolitan Area (Source: INE, Censuses: 1981, 1991, 2001, 2011, 2021)

	Employed population				Student population			
Year	**Total**	**Car use**	**% of car use**	**Percentage variation**	**Total**	**Car use**	**% of car use**	**Percentage variation**
1981	141,885	5,848	4%	-	39,858	1,555	4%	-
1991	152,732	17,701	12%	181%	66,783	7,423	11%	185%
2001	111,583	52,820	47%	308%	83,391	23,080	28%	149%
2011	50,419	31,852	63%	33%	85,655	26,348	31%	11%
2021	40,339	27,636	69%	8%	88,029	29,956	34%	11%